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EXAMINER
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 17

Application Number: 08/908,778
Filing Date: August 7, 1997
Appellant(s): Scheps

James Albert Ward
For Appellant

EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed December 19, 2001.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-7 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

5,457,639	ULICH et al.	10-1995
5,822,047	CONTARINO et al.	10-1998
5,082,362	SCHNEITER	01-1992
5,117,126	GEIGER	5-1992

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 U.S.C. § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 5, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Ulich et al. (US Patent no. 5,457,639).

Regarding claims 1 and 7, Ulich et al. discloses in fig. 1 the same imaging lidar comprising a pulsed laser for generating at a pulse rate a sequence of light beam pulses each having a pulse width (See Ulich et al. col. 5, lines 23-27), the lidar comprising a spatial discriminator coupled to the pulsed laser for steering the light beam pulse sequence in a plurality of scan lines describing an area surrounding a target each scan line surrounding the target (See Ulich et al.'s abstract, and col. 5, lines 6-15, and lines 25-41, and see fig. 3A-3B from beam footprint 30) wherein the spatial discriminator is Ulich et al.'s scanner 20 which steers the output of the beam projector to provide the pulsed width, a photomultiplier tube for detecting energy from the light beam pulses scattered by the target and for generating an output signal representative of the scattered light beam (See Ulich et al. fig. 5, item 104, and col. 6, lines 49-51), an image acquisition controller coupled to the pulsed laser and to the photomultiplier tube for selecting pulse width and pulse rate of the light

beam pulses and for generating a display signal from the output signal of the photomultiplier tube (See Ulich et al. fig. 1, scanner 20 and camera 18, and col. 5, lines 28-41), and a display coupled to the controller for generating an image from the display signal representative of the target (See Ulich et al. col. 6, lines 23-32) wherein Ulich et al. image includes no more than one pixel representing each of the light beam pulses.

As per claim 3, Ulich et al. further discloses the same imaging lidar wherein the pulse width in about 5ns (See Ulich et al. col. 5, lines 9-15).

As per claim 5, Ulich et al. further discloses the same imaging lidar wherein the controller gates the output signal from the multiplier tube to select a range interval that includes the target (See Ulich et al. col. 6, lines 42-53).

Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ulich et al. (US patent no. 5,457,639) in view of Contarino et al. (US Patent no. 5,822,047).

Regarding claim 2, Ulich et al. discloses substantially the same limitations as previously set forth in the above rejection of claim 1.

It is noted that Ulich et al. fails to particularly disclose the same imaging lidar wherein the laser has a wavelength corresponding to blue-green color.

Contarino et al. discloses the same imaging lidar wherein the laser has a wavelength corresponding to blue-green color (See Contarino et al. col. 2, lines 61-64).

Therefore, it is considered obvious that one skilled in the art at the time of the invention having Ulich et al. and Contarino et al. before him/her, would be motivated to incorporate the laser having a wavelength corresponding to blue-green color in Ulich et al.'s imaging lidar for the same purpose of minimizing absorption in water as taught by Contarino et al.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ulich et al. (US patent no. 5,457,639) in view of Schneiter (US Patent no. 5,082,362).

As per claim 4, Ulich et al. discloses substantially the same limitations as previously set forth in the above rejection of claim 1.

It is noted that Ulich et al. fails to particularly disclose the same imaging system wherein the pulse rate is about 600 Khz.

Schneiter discloses the same imaging system wherein the pulse rate is about greater than 600 KHz (See Schneiter col. 16, lines 31-33).

Therefore, it is considered obvious that one skilled in the art at the time of the invention having Ulich et al. and Schneiter before him/her, would have had no difficulty to modify the imaging lidar system by providing a pulse rate of about 700 Khz for the same purpose of giving finer control over the raster scan rate as taught by Schneiter.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ulich et al. (US patent no. 5,457,639) in view of Geiger (US Patent no. 5,117,126).

Regarding claim 6, Ulich et al. discloses substantially the same limitations as previously set forth in the above rejection of claim 1.

It is noted that Ulich et al. fails to particularly disclose a periodically poled crystal gain element for generating laser output having frequency that is a multiple of a pumping frequency.

Geiger discloses a periodically poled crystal gain element for generating laser output having frequency that is a multiple of a pumping frequency (See Geiger col. 5, lines 45-56, and col. 6, lines 7-15).

Therefore, it is considered obvious that one skilled in the art at the time of the invention having Ulich et al. and Geiger before him/her, would have had no difficulty to modify Ulich et al.'s imaging lidar by incorporating the periodically poled crystal gain element for generating laser output having frequency that is a multiple of a pumping frequency for the same purpose of achieving a balance of the effective gain of the crystals as taught by Geiger (See Geiger col. 3, lines 51-60).

Response to Arguments

Regarding the above claims, the appellant argues that Ulich neither considers nor suggests temporal and spatial discrimination of lines of pixels. The examiner respectfully disagrees since applicant's own disclosure states that "*the pulsed laser 102 emits pulses ... to match the data acquisition rate of typical CW lidar systems. This is possible due to the short pulses . The pulses may be scanned transversely with respect to the direction of relative motion to generate the scan lines as shown.*" A close look at Ulich col. 5, lines 6-15, and lines 25-41 will show the same lidar comprising the spatial discrimination coupled to the laser for steering the light beam.

The appellant further argues that he/she teaches a "*line scan*" technique for accumulating a matrix of pixels making up a complete visual image under water. While the examiner acknowledges that

such limitation is claimed, Ulich discloses accumulating matrix using the same scanning technique (See Ulich figs 3A and 3B). Because in col. 7, lines 16-19, Ulich '639 clearly states that *"the high degree of scan lines provides for precise image to image intercalibration and registration"* while Ulich '639 discloses a scanner 20 providing the discrimination, it should be concluded that line scanning is a "must" in Ulich '639. An example of such line scanning is shown in figs. 3A-3B where the scan lines are clearly shown. In addition, applicant's claim 1 does not call for temporal discrimination. Only claim 5 calls for temporal discrimination. However, the claimed feature of claim 5 is taught by Ulich '639 in col. 6, lines 41-42. Further while Ulich performs the scanning in the roll direction pixels are accumulated which will send the detected image to the visual display monitor (See Ulich col. 6, lines 23-32).

The appellant further argues that the claimed *"temporal discrimination of the range gating element"* is neither taught nor suggested. The examiner respectfully disagrees since Ulich teaches a gateable microchannel plate which provide the same gating as claimed above (See Ulich col. 5, lines 28-36). While the appellant insists on the temporal discrimination of the range gating, a look at page 6 of the appellant only disclose that the line scan reduces the backscattered return signal by spatial discrimination. In col. 5, lines 37-41, Ulick discloses that the camera characteristics include the claimed gating and also the " water backscatter" is also reduced. In addition, the appellant uses a 5 ns pulse while performing the temporal discrimination. In col. 5, lines 11, Ulick clearly disclose using pulses less than 20 ns. It is clear that 5 ns is less than 20 ns. Therefore, the

limitation is clearly met by Ulick. In fact if Ulick insists on using pulses less than 20 ns, it is because Ulich acknowledges that each pulse defines a single pixel and the pulse width does matter in recognizing the object under water one the scan lines are combined.

Appellant further argues that the combination of Ulich et al. and Contarino et al. neither teaches nor suggests "temporal and spatial discrimination" and "range-gating". The examiner respectfully disagrees because while Ulich suggests pulse width of less than 20 nsec and an automatic gating component in col. 5, lines 10-11 and col. 6, lines 38-53 respectively, Contarino et al. does disclose the "temporal and spatial discrimination" feature in col. 4, lines 10-16. And in particular the range-gating is suggested in col. 4, line 13-14. Finally, while the appellant explains the Ulich '639 (MCP), he/she never show the difference between Ulich '639 geatable microchannel plate (MCP) which provides both fast gating and low noise amplification (See Ulich '639 col. 5, lines 23-40) and the claimed "range gating".

The appellant further argues that neither Ulich nor Scheniter a lidar imaging device. And instead a video camera is disclosed. In response, the examiner would urge the appellant to indicate how a camera is not an imaging device. Further, the appellant indicates that his/her claim specifies that the pulse rate of the imaging lidar above 600 Khz. A close reading of Schneiter col. 16, lines 18-19, will show that lower rates can be used, however, the prior art strongly suggests to use fast pulse rates (600 Khz as claimed). While the examiner may agree that in the example used

by Schneiter "up to 500 Khz" is used, however, the prior art never precluded pulse rates higher than 500 Khz.

The appellant further argues that Geiger neither teaches nor suggests the claimed periodically poled crystal and that the examiner is using hindsight, using the appellant's disclosure as a road-map. The examiner disagrees since in col. 5, lines 45-56 the claimed limitations are present. In addition, the reasons of "achieving balance of effective gain of the crystals" is given by Geiger in col. 3, lines 56-60.

For the above reasons, the examiner kindly submits that claims 1-7 are not allowable. Therefore, it is believed that the rejections should be sustained.

Respectfully submitted,

Primary Examiner

Gims Philippe

Patent Examiner

March 6, 2002

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